

EXHIBIT E

(12) **United States Patent**
Goodman

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(54) **VIDEO TRANSMISSION AND CONTROL SYSTEM UTILIZING INTERNAL TELEPHONE LINES**

(75) Inventor: **David D. Goodman**, Arlington, VA (US)

(73) Assignee: **Inline Connection Corporation**, WA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

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Related U.S. Application Data

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(51) **Int. Cl.**⁷ **H04M 11/00**

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(58) **Field of Search** **379/90.01, 93.01, 379/93.05-93.08, 93.15, 93.26, 93.28, 93.37, 110.01, 102.01-102.03; 348/14.01-14.05, 734; 359/142, 145-148**

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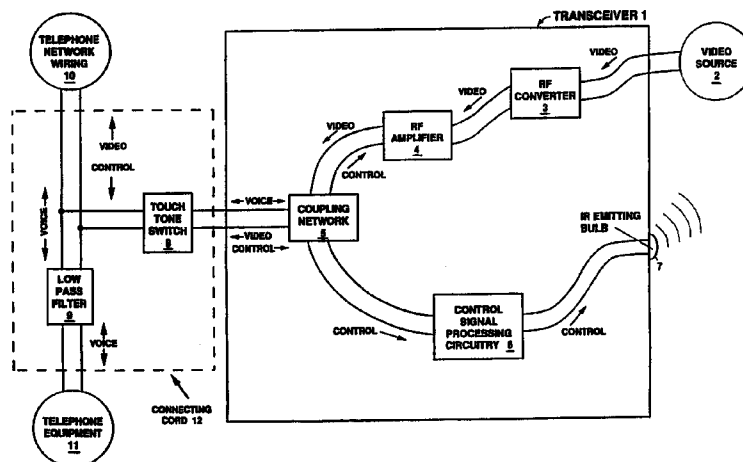
Primary Examiner—Wing Fu Chan

(74) *Attorney, Agent, or Firm*—Staas & Halsey LLP

(57) **ABSTRACT**

A video transmission system for facilitating transmission of video and control signals, particularly infrared remote control signals, between different locations in a residence using existing telephone wiring. Simultaneous transmission of signals of both types over active telephone lines is possible without interference with telephone communications. Transmission succeeds without requiring special treatment of the video signals beyond RF conversion, despite signal attenuation inherent in transmission over the telephone line media. Two or more video sources may be tied into the system, and selected as desired. Remote control signals generated in one room may be utilized without requiring a clear line of sight between the remote control device and the receiver.

41 Claims, 8 Drawing Sheets



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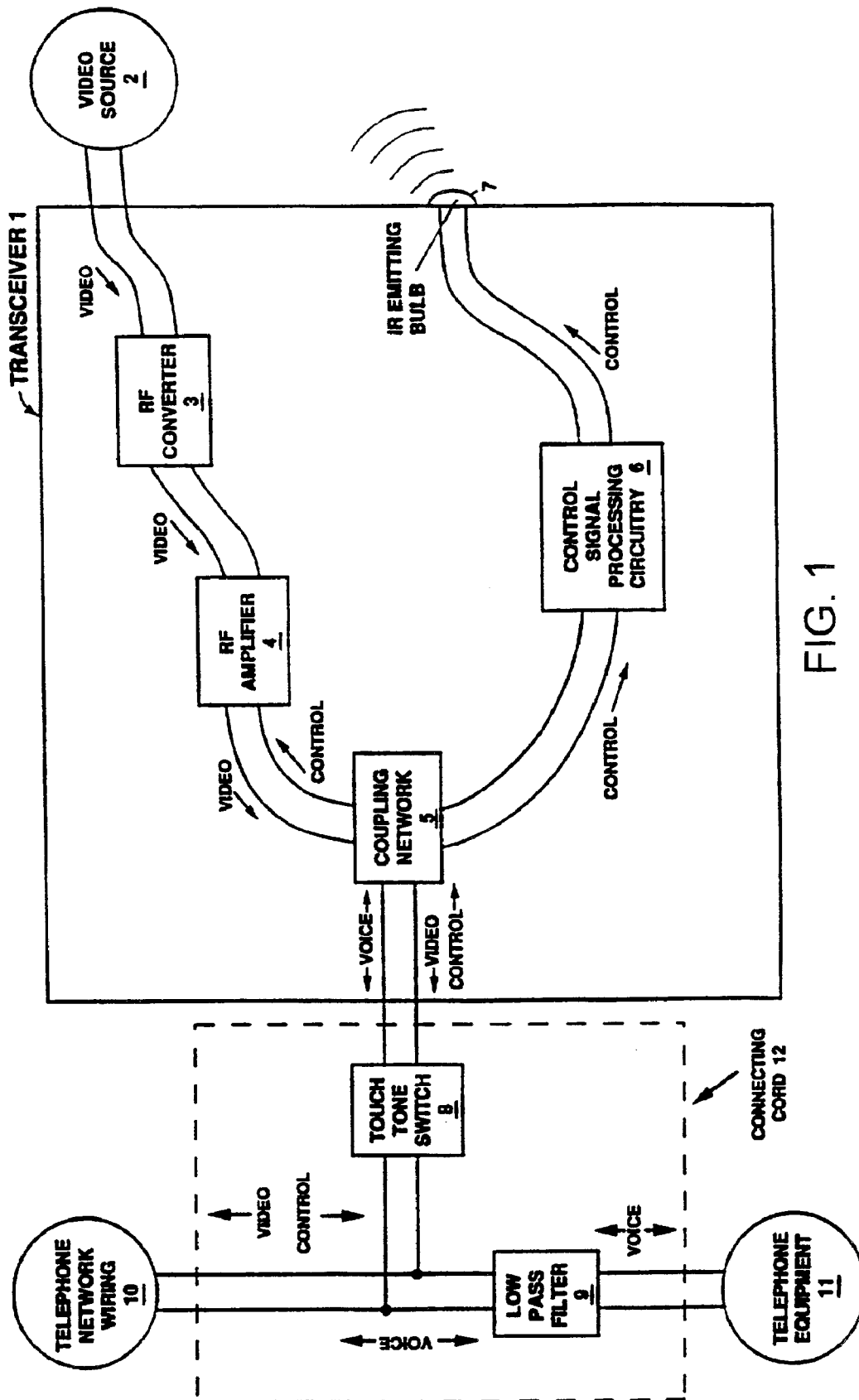


FIG. 1

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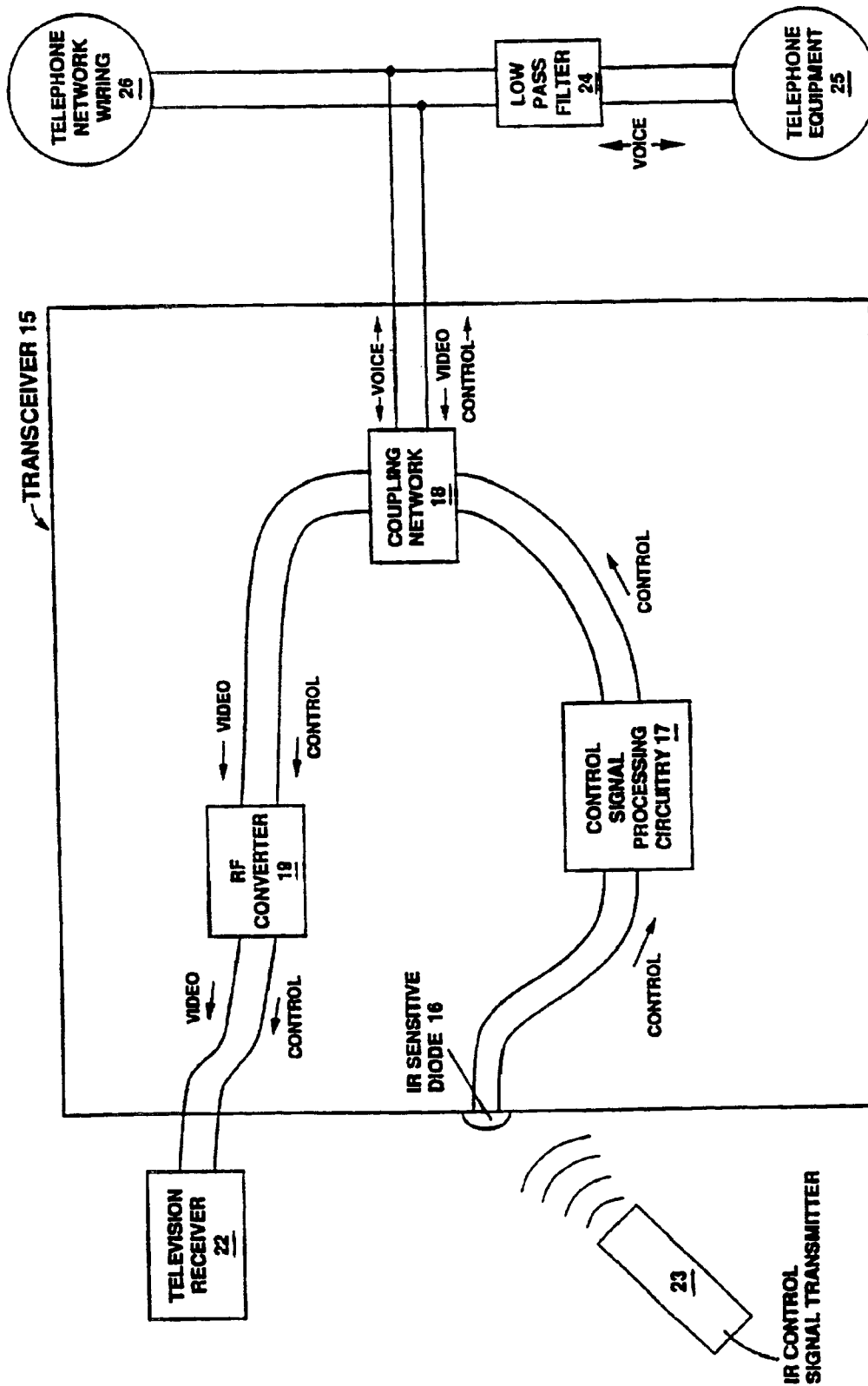


FIG. 2

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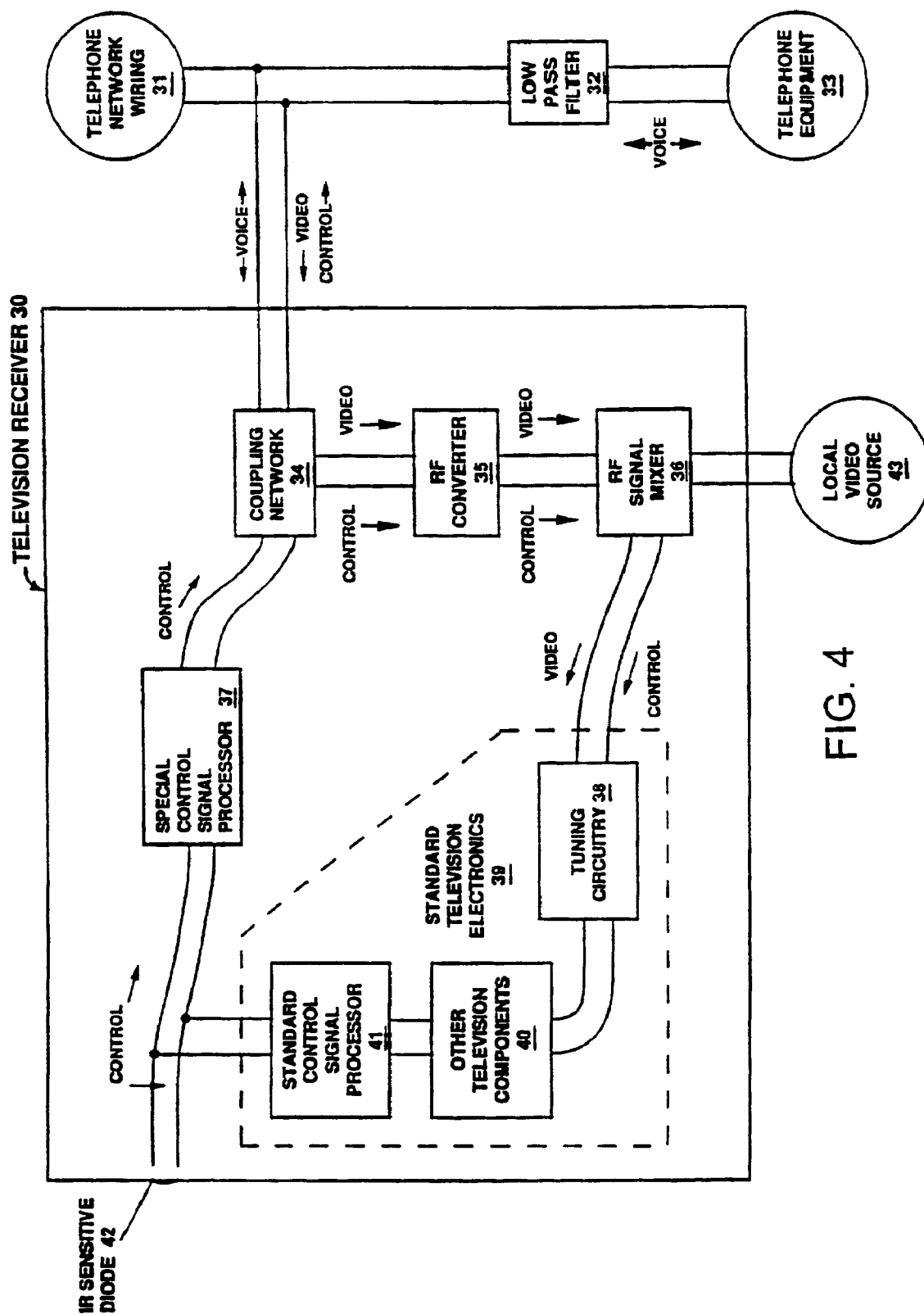
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	RF CONVERSION WITHIN THE VIDEO SOURCE TRANSCIEVER	RF CONVERSION WITHIN THE TELEVISION TRANSCIEVER
SYSTEM 1	CONVERT ENERGY WITHIN THE 12 MHZ BAND BETWEEN 60 MHZ AND 72 MHZ, WHICH COVERS VHF CHANNELS 3 AND 4, TO A 12 MHZ BAND LOWER IN FREQUENCY. EXAMPLE: A DOWNSHIFT OF 36 MHZ WOULD MAP VHF 3/4 TO THE BAND BETWEEN 24 MHZ AND 36 MHZ.	CONVERT THE ENERGY IN THE RESULTING 12 MHZ BAND UPWARDS BY AN EQUAL AMOUNT, MAPPING THE SIGNAL BACK TO ITS ORIGINAL CHANNEL.
SYSTEM 2	MODULATE THE BASEBAND SIGNAL TO ONE OF TWO ADJACENT 6 MHZ BANDS BELOW VHF 2, ACCORDING TO A SWITCH SET BY THE USER. EXAMPLE: MODULATE THE SIGNAL TO EITHER THE BAND COVERING 24 MHZ TO 30 MHZ, OR THE BAND COVERING 30 MHZ TO 36 MHZ.	COVERT THE 12 MHZ BAND COVERING BOTH ADJACENT SUB-VHF 2 CHANNELS UPWARDS TO ADJACENT TUNABLE CHANNELS. EXAMPLE: AN UPWARDS CONVERSION OF 150 MHZ WOULD CONVERT SIGNALS TO THE 12 MHZ BAND COVERING 174 MHZ TO 186 MHZ, WHICH CORRESPONDS TO VHF CHANNELS 7 AND 8. THE FREQUENCY OF THE INPUT SIGNAL WOULD DETERMINE THE OUTPUT FREQUENCY.
SYSTEM 3	MODULATE THE BASEBAND SIGNAL TO A 6 MHZ BAND BELOW VHF 2, THE BAND COVERING 24 MHZ TO 30 MHZ, FOR EXAMPLE.	CONVERT THE 6 MHZ BAND CONTAINING THE SIGNAL UPWARDS TO ONE OF TWO ADJACENT TUNABLE CHANNELS, ACCORDING TO A SWITCH ON THE TELEVISION TRANSCIEVER. EXAMPLE: A CONVERSION OF 150 MHZ OR 156 MHZ UPWARDS WOULD MAP THE SIGNAL TO VHF CHANNEL 7 OR 8.

FIG. 3



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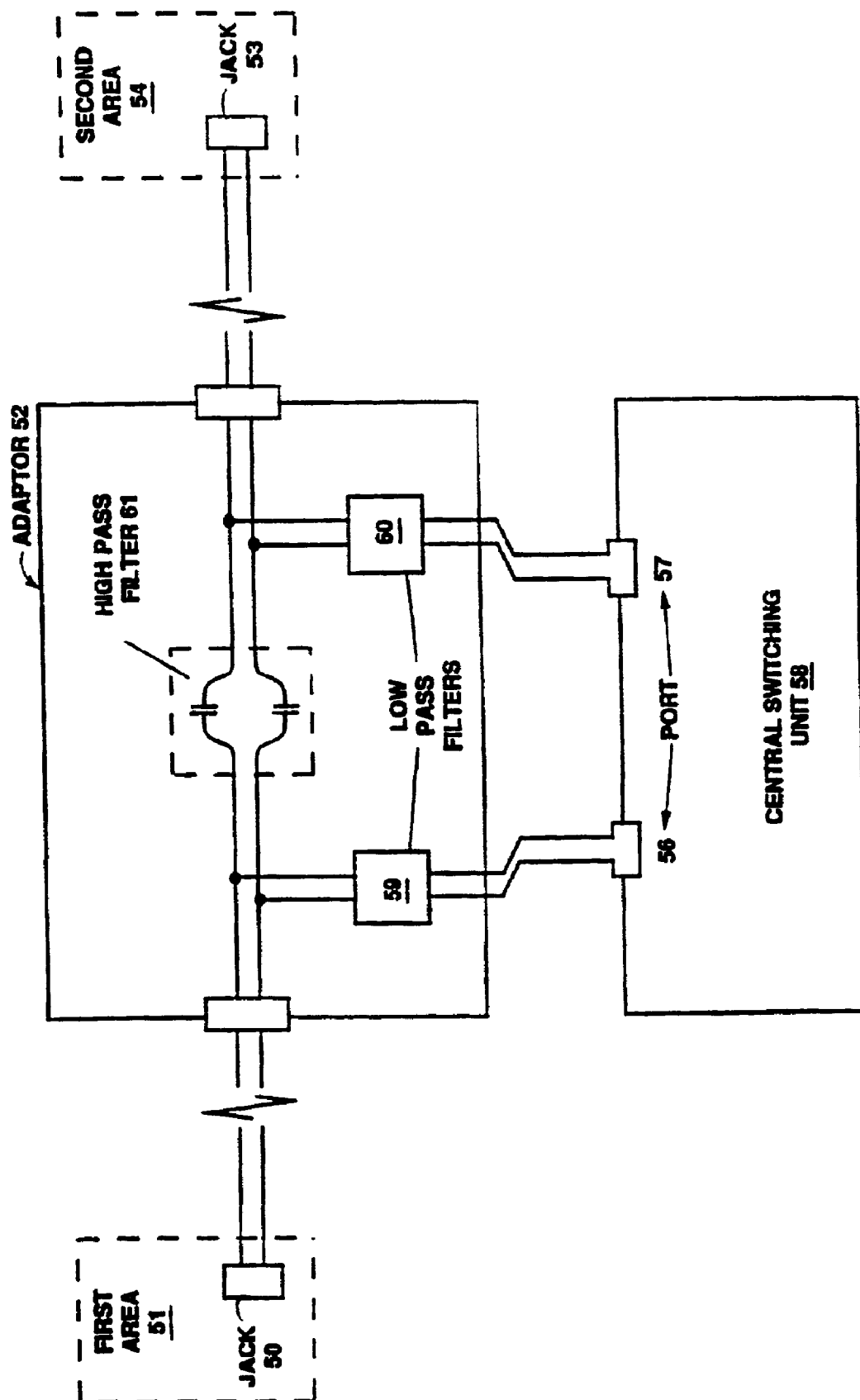


FIG. 5

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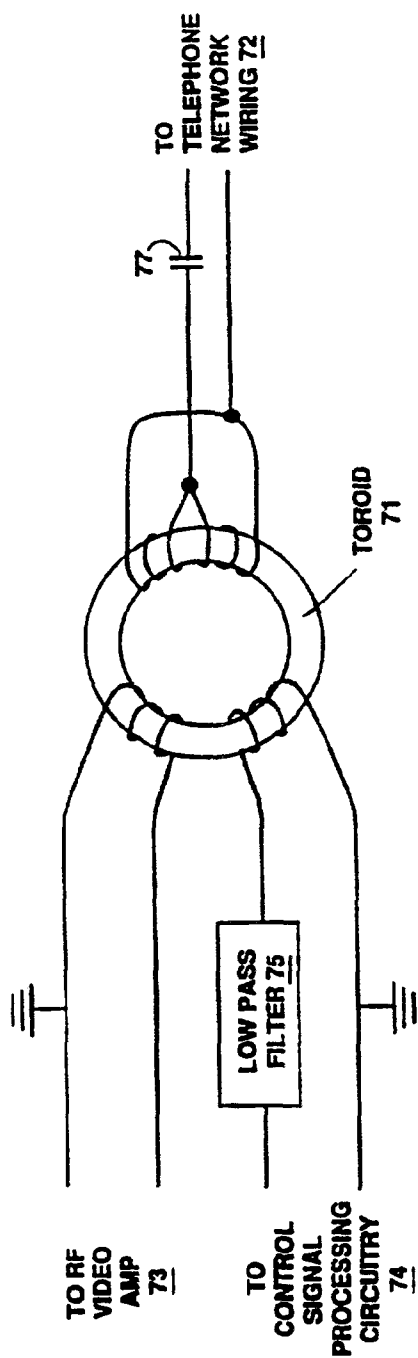


FIG. 6

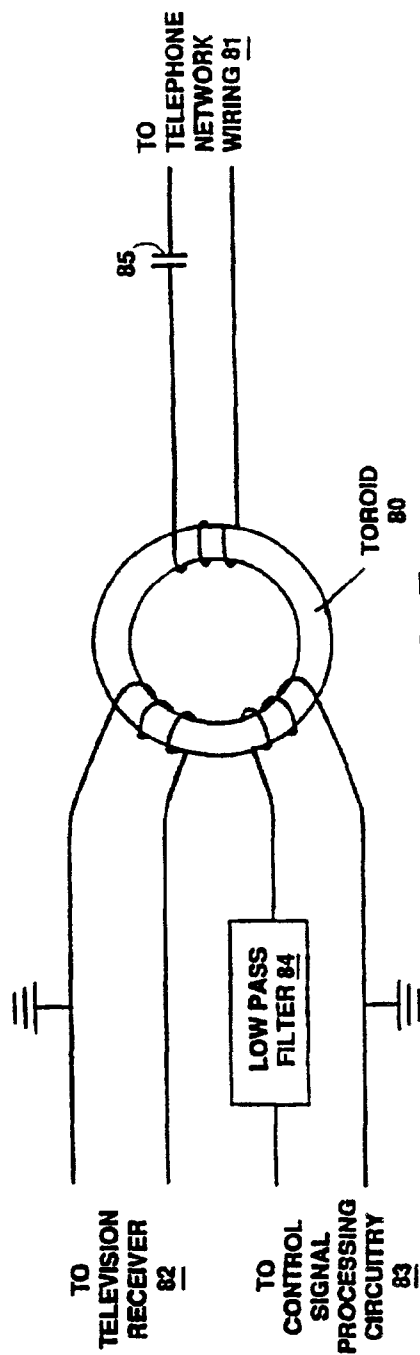
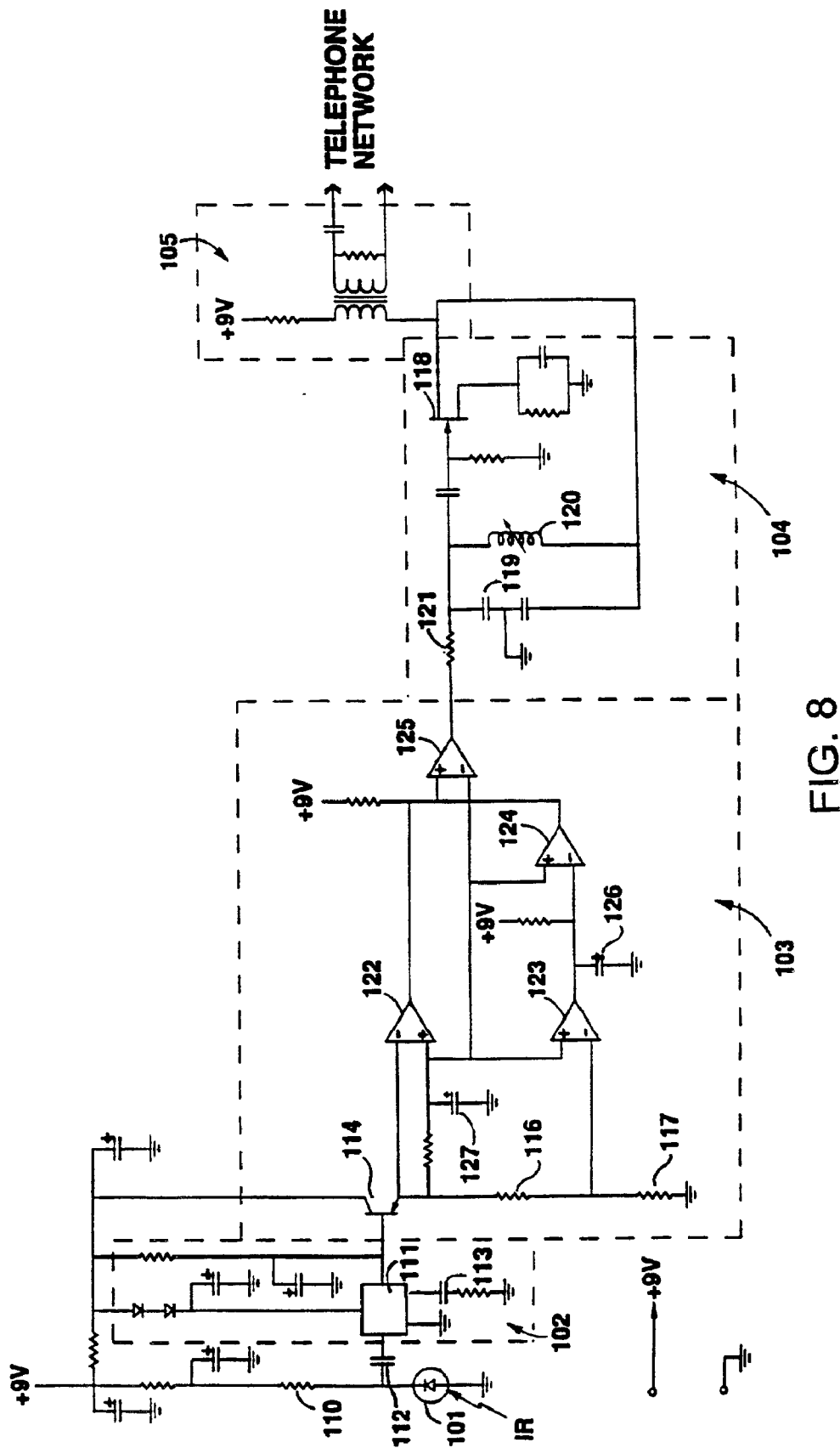


FIG. 7



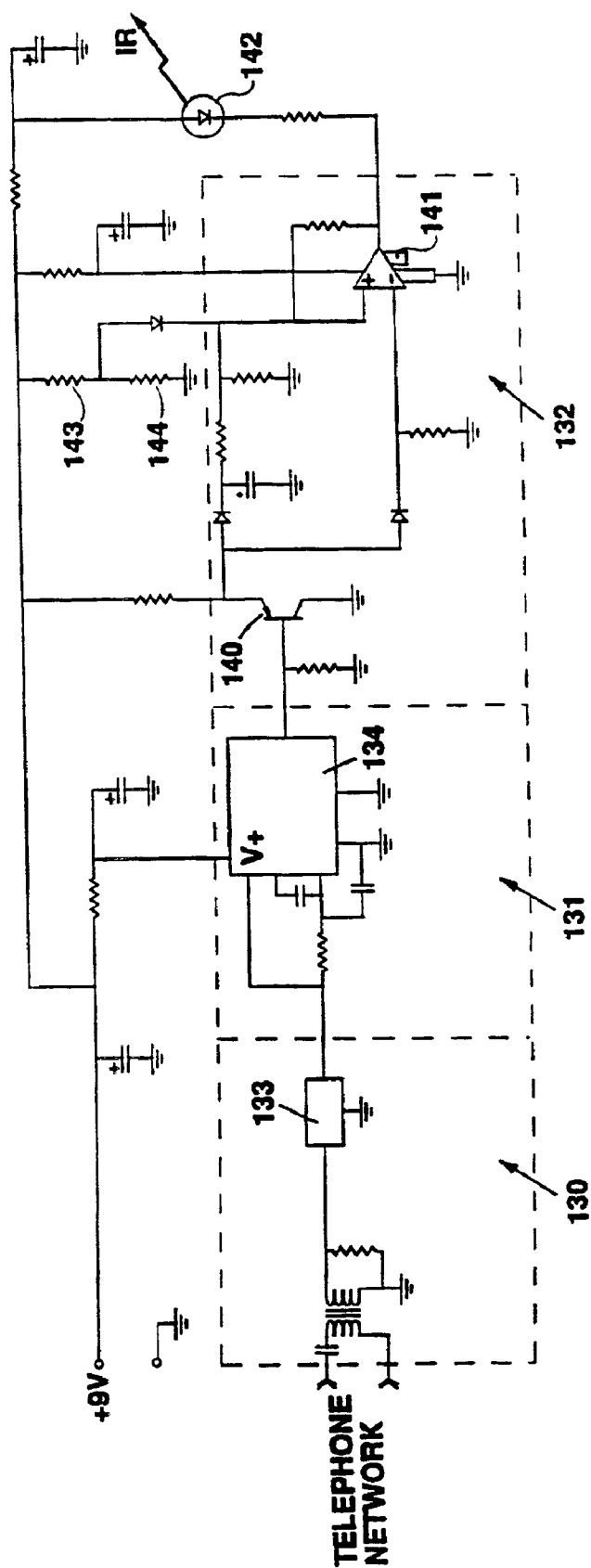


FIG. 9